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ABSTRACT

Because of the high incidence of divorce and increase in the proportion of births to unmarried women, more children are spending at least a portion of childhood living with only one parent. This study uses data from the 1984 Panel of the Survey of Income and Program Participation (SIPP), to address the relationship between family structure and the economic well-being of children. Results suggest that family income available to children drops by 37 percent immediately following loss of a father. The economic differences between children who experience family disruption and those who do not result from two factors: the economic hardship brought on by a father's departure and the fact that economic disadvantage tends to precede family disruption. In addition, children who experienced a marital disruption were better off after the disruption than those who were in one-parent families throughout the period. Similarly, children whose mothers were observed to remarry or reconcile were better off while they lived in single parent families than children who lived with their mother only throughout the panel. (Extensive appendices are included on the SIPP program, with 15 tables; 13 tables appear in the text.) (LLL)

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CURRENT POPULATION REPORTS

Household Economic Studies

Series P-70, No. 23

by
Suzanne Bianchi
Bureau of the Census
and
Edith McArthur
National Center for
Education Statistics

Family Disruption and Economic Hardship: The Short-Run Picture for Children



SHIPP

Survey of Income and Program Participation

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Survey of Income and Program Participation



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Family Disruption and Economic Hardship: The Short-Run Picture for Children

INTRODUCTION

This report analyzes the effect of family disruption on the economic well-being of children. Because of the high incidence of divorce and increase in the proportion of births to unmarried women, more children are spending at least a portion of childhood living with only one parent. The achievements of children in their adult lives are affected by family structure and income during childhood.¹ Therefore, understanding how family disruption affects the economic status of children is important in understanding the current well-being of children and the long-run impact of changing family patterns.

This study augments existing research on the relationship between family structure and the economic well-being of children by focusing on the immediate repercussions of a parental departure from the household. Three questions are addressed: What happens to household income at the time a father leaves the household and in subsequent months? To what extent is the income loss associated with the departure of a father alleviated by either public assistance or child support payments from the absent parent? What changes occur in the labor force participation of the mother?

Data from the 1984 Panel of the Survey of Income and Program Participation (SIPP) are used to address these questions. The SIPP is designed to provide detailed information on short-term changes in the income and program participation of persons and households in the United States. The first interviews for the 1984 Panel were conducted between October 1983 and January 1984. Each sample household was visited seven more times at 4-month intervals. The eighth interview was conducted between February and May of 1986. Information was obtained on all members of sampled households. Household members 15 years or older and children who remained with a household member 15 years or older were followed to new addresses if they moved during the period.

At each interview, respondents reported on household composition, earnings, other cash and noncash

income received, and program participation for each of the four months preceding the interview. For each household member, reports of economic status for a 32-month period were obtained. With these data, it is possible to construct a highly detailed picture of the economic situation of a household at any time during the observation period.

For this investigation into children's economic well-being, the sample includes those children under the age of 15 at the time of the first interview and for whom 32 months of data on household income and family composition exist. Information on the marital status, employment, earnings, income, and welfare reciprocity of the child's parents for the 32-month period are linked to each child's record.² Longitudinal panel weights are used to make population estimates and to compensate for panel attrition.

HIGHLIGHTS

(Numbers in parentheses denote 90-percent confidence intervals of the estimates.)

- During the 1984 SIPP Panel, 71.1 (± 1.6) percent of children lived continuously with the same two parents. A small but important subgroup of children, 5.6 (± 0.6) percent, lived with two parents at the beginning of the survey but had a father who left the household during the subsequent 28 months of observation.
- On average, the economic well-being of children improved over the course of the panel. Average monthly family income increased from \$2,453 ($\pm \70) to \$2,622 ($\pm \55). Per capita income increased from \$575 ($\pm \15) to \$610 ($\pm \12) and the ratio of family income to needs increased from 2.51 (± 0.07) to 2.67 (± 0.06). The percentage in poverty dropped from 21.4 (± 1.5) to 18.8 (± 1.1) percent.
- At the time of the last, or eighth, interview, children who had remained with the same two parents throughout the panel had monthly family income which averaged \$3,060 ($\pm \70), compared with \$1,815 ($\pm \210)

¹For example, daughters living in single-parent families at some point during adolescence are more likely to become household heads and to go on welfare than those in two-parent families. See Sara McLanahan and Karen Booth, "Mother-Only Families: Problems, Prospects, and Politics," *Journal of Marriage and the Family*, Vol. 51 (August 1989), pp. 557-580. See also, Martha S. Hill and Greg J. Duncan, "Parental Family Income and the Socioeconomic Attainment of Children," *Social Science Research*, Vol. 16 (1987), pp.39-73.

²Interviewers were instructed to identify the mother, if she was a household member, otherwise the father as the "parent" of the child. That parent's identification number was then placed on the child's record. Using this key, the identified parent at the first interview was located and linked to the child. If that parent was married and living with a spouse at the first interview, a similar key on the parent's record identifying the spouse was used to locate the child's other parent if present in the household.

among children whose father had left the household, \$1,176 (\pm \$74) among children who had lived with their mother only throughout the panel, and \$2,506 (\pm \$291) among children whose mother had remarried or reconciled during the course of the panel. Children who lived with their mother only were the most economically disadvantaged at both the beginning and the end of the survey.

- For children who experienced the loss of their father from the household during the panel, economic disadvantage pre-existed the parental loss. At the time of the first interview, the monthly family income of children who would subsequently experience their parent's marital separation was only 82.8 (\pm 7.4) percent that of children who remained in stable, two-parent families. Among the former group, 21 (\pm 7.4) percent were in poverty at the time of the first interview compared with 12 (\pm 1.3) percent of the latter group. Fathers who would eventually depart were much less likely to work full time, all weeks of the reporting period for the first interview than were fathers who lived with their children throughout the survey.
- There were also significant economic differences at the time of the first interview between two subgroups of children in mother only families. Those who would remain in mother only families throughout the panel were less likely to receive child support payments and more likely to receive food stamps and benefit from AFDC payments at the time of the first interview than were the group of children whose mother remarried or reconciled with an absent spouse before the end of the panel. At the first interview, the differences in reciprocity between the former and the latter group were the following: 21.6 (\pm 3.2) versus 34.6 (\pm 9.6) percent received child support, 50.3 (\pm 3.4) versus 36.1 (\pm 6.5) percent received food stamps, and 39.9 (\pm 3.2) versus 29.0 (\pm 7.6) percent relied on AFDC payments.
- The estimates of income loss associated with a father's departure were the following: monthly family income declined from \$2,435 (\pm \$182) to \$1,543 (\pm \$216), or by 37 percent; per capita income declined from \$549 (\pm \$51) to \$436 (\pm \$58), or by 21 percent; the ratio of family income to needs declined from 2.4 (\pm 0.2) to 1.8 (\pm 0.3), or by 26 percent; and the percentage in poverty increased from 13.8 (\pm 5.5) to 35.5 (\pm 7.0) percent.
- The percentage of children with mothers who worked full-time, all weeks of the reporting period increased from 33.4 (\pm 6.0) to 41.2 (\pm 7.7) percent following the loss of a father from the household and the percentage not working at all declined from 43.4 (\pm 7.4) to 31.0 (\pm 6.4) percent. However, the percentage not working at all returned to the pre-separation level by a fourth time period after the marital disruption.

- The proportion receiving child support increased from 15.7 (\pm 4.7) before the disruption to 43.5 (\pm 5.9) percent during the first time period after the father left the household. The percentage of these children whose mother's relied in part on AFDC increased from 9.0 (\pm 3.9) to 18.2 (\pm 6.3) percent just after the separation and the percentage receiving food stamps increased from 9.5 (\pm 3.9) to 26.6 (\pm 6.1) percent.

LIVING ARRANGEMENTS OF CHILDREN

As shown in table A, at the beginning of the 1984 SIPP Panel, 77.9 percent of all children were living with both parents; 19.3 percent with their mother but not their father; 1.6 percent with their father but not their mother; and 1.2 percent lived with neither parent. It should be noted that "parent" in the SIPP, as in the Current Population Survey (CPS), includes step- and adoptive, as well as biological, parents. Table A also shows children's experience of parental loss (or gain) in subsequent months. By the end of the SIPP Panel, 28 months after the initial interview, 71.1 percent of all children had lived in stable, two-parent families throughout the observation period.

An additional 24.4 percent of all children lived in a household in which their mother was always present but which did not always include a father: 16.2 percent lived with their mother only throughout the panel, 5.6 percent witnessed the departure of their father from the household during the course of the panel, and 2.7 percent began the panel living with their mother only but subsequently experienced their mother's remarriage or reconciliation with an absent spouse. A small proportion of children (2.7 percent) lived continuously with their father but had an absent mother during all or part of the panel and 1.8 percent spent some portion of the panel living in a household which included neither parent.

At the beginning of the panel, the vast majority of White children (84.1 percent) were living with two parents whereas one-half of Black children (50.9 percent) lived with their mother only. Primarily because so many more Black than White children were in single-parent households at the start of the panel, only 37.2 percent of Black children, compared with 77.2 percent of White children resided in stable, two-parent families throughout the panel. Among Hispanic children, the comparable figure was 66.9 percent.

THE MEASUREMENT OF INCOME

Four measures of income are used in this report to assess the economic-well being of children. The first two measures, family and household income, differ in that household income aggregates income of all persons residing with the child in a given month, whereas family income excludes income from persons not related

Table A. Children's Household Living Arrangements at the Beginning of and During the 1984 SIPP Panel, by Race

(Numbers in thousands)

Living arrangements	Total	White	Black	Hispanic ¹
BEGINNING OF PANEL				
Total children	51,862	42,171	7,943	4,943
Percent.	100.0	100.0	100.0	100.0
Two parents	77.9	84.1	43.7	72.8
Mother only	19.3	13.7	50.9	25.0
Father only	1.6	1.6	1.4	1.2
Neither parent	1.2	0.6	4.1	0.9
EXPERIENCE DURING PANEL				
Total children	51,862	42,171	7,943	4,943
Percent.	100.0	100.0	100.0	100.0
Always two parents present	71.1	77.2	37.2	66.9
Mother always present, father absent all or part of panel ...	24.4	19.0	55.3	29.2
Father leaves household	5.6	5.6	5.5	4.3
Always mother only	16.2	10.8	46.4	22.4
"Father" enters household	2.7	2.6	3.4	2.6
Father always present, mother absent all or part of panel ...	2.7	2.7	2.1	2.5
Neither parent present all or part of panel	1.8	1.1	5.4	1.4

¹Persons of Hispanic origin may be of any race.

to the child. The next two measures, per capita income and the ratio of income to the poverty threshold, referred to in the tables as income/needs, are two frequently used measures which adjust for differences in household size and family composition.

The per capita measure relates household income to the number of persons living in the household in a given month and adjusts for changes in the number of persons residing together from one month to the next. However, no adjustment for the relatively higher fixed costs of smaller households is made.

The income/needs measure relates family income to the poverty threshold appropriate to the size and age composition of the child's family in a given month. This measure is the only one which incorporates an adjustment for the economies of scale realized by larger families. An income/needs measure of 1.00 indicates that the family has just enough income to cover its financial needs with needs estimated at 1/12 the annual poverty threshold for a family of that size and composition. A ratio less than one indicates that the family income of the child is not sufficient to maintain a minimally adequate standard of living if "minimally adequate" is defined as 1/12 of the annual poverty threshold. Ratios in excess of 1.00 provide an indication of how much a family's income exceeds the minimally adequate level.

The mean monthly income amounts shown in the tables are calculated by averaging the monthly income amounts for the 4-month reference period of each interview. Four-month averages smooth income fluctuation within an interview reference period and are used rather than monthly income amounts so as not to exaggerate change between interviews. This strategy compensates to some extent for the "seam bias", that

is, the known fact that reported monthly income amounts vary less from month-to-month within an interview reference period than for the two months which span the reference period of one interview to the next.

The family, household, and per capita dollar amounts throughout this report are all adjusted to January-April 1986 average dollars, using the monthly Consumer Price Index to correct for inflation during the course of the panel. The poverty threshold which forms the denominator of the income/needs ratio is also adjusted upward over the period by the Consumer Price Index (CPI). Hence, the percent change estimates reflect, to the extent possible, real increase (or decrease) in income over the period.

The measurement of income available to a child's family or household in the SIPP is more accurate than that provided by the March CPS, the most commonly used data source for assessing economic well-being. In the SIPP, income of household or family members who actually live with the child in a given month is counted and included in the family and household income measures for the child. That is, the SIPP monthly family and household income measures reflect the actual household composition for that month and month-to-month changes in household composition are incorporated in month-to-month changes in income of the household or family. In CPS, income in the previous year for household and family members residing together in March of the following year is used to determine family and household income. Hence, in the CPS, the family income of children would include the income of members in the household in March whether or not they actually resided with the child in the preceding year. Conversely, the income of members who may have lived with the child and provided income during the preceding year but who

were not still living in the household in March of the following year is not included.

CHANGES IN CHILDREN'S ECONOMIC WELL-BEING

Table B shows change between the beginning and end of the 1984 SIPP panel in the average monthly income available to children. On average, children experienced real income improvement over the course of the panel. On each measure of income, the estimate of income growth was between 6 and 7 percent and there was a 12 percent decline in the percentage of children in families with income below the poverty threshold.

Children who lived in stable, two-parent families had income equal to or greater than all other groups of children at the beginning of the survey and remained the most economically advantaged group by the end of the survey. During the panel, mean monthly family income increased from \$2,834 to \$3,060, an increase of 8 percent, and the ratio of family income to the poverty threshold increased from 2.87 to 3.06 for these children.

The family economic situation either deteriorated or did not change substantially for most of the other groups of children. The one exception was the group of children who lived only with their mother at the first interview but whose mother either remarried or reconciled with their father. Family income more than doubled

for these children, from \$1,164 to \$2,506, and the income needs ratio increased from 1.4 to 2.6, a 90-percent increase.

During the panel, those who saw their father move out of the household had family income which dropped from \$2,346 a month at the time of the first interview to \$1,815 a month by the last interview, a decrease of 23 percent. Per capita income and the income/needs ratio, the two measures which adjusted for the decrease in household size after the father's departure, showed less of a decline over the period. Per capita income decreased by \$45 a month, or 8.5 percent. Family income was about 2 1/3 times needs, on average, at the start of the panel but declined to around 2 times needs by the last interview, a decline of almost 13 percent.

The relatively large group of children who lived with their mother only throughout the panel experienced some improvement in average well-being as measured by per capita income and the income/needs ratio but no significant decline in the percentage in poverty. At the eighth interview, 53 percent of children in homes which included only their mother throughout the panel were in poverty, compared with 38 percent of children who spent some time with neither parent, 31 percent who experienced their father's departure from the household, 18 percent who "gained" a father, 13 percent who lived with their father only for all or part of the panel, and 10 percent who remained in two-parent families.

Table C depicts change in the economic well-being of children in the various family situations relative to those children living with two-parents throughout the panel.

Table B. Change in Average Monthly Income (Constant Dollars) Between First and Eighth Interviews, by Living Arrangements during the Panel

Income	Total children	Always two parents	Mother always present			Father always present	Neither parent present
			Father leaves	Mother Only	"Father" enters		
Mean family income:							
First interview	\$2,453	\$2,834	\$2,346	\$1,132	\$1,164	\$2,434	\$1,615
Eighth interview	2,622	3,060	1,815	1,176	2,506	2,320	1,466
Percent change	6.9	8.0	-22.6	3.8	115.4	-4.7	-9.3
Mean household income:							
First interview	2,488	2,847	2,359	1,119	1,428	2,508	1,855
Eighth interview	2,645	3,073	1,821	1,247	2,421	2,356	1,625
Percent change	6.3	7.9	-22.3	4.2	69.6	-6.1	-12.4
Mean per capita income:							
First interview	575	649	530	305	395	619	447
Eighth interview	610	689	485	328	591	611	443
Percent change	6.1	6.2	-8.4	7.5	49.7	-1.3	-1.0
Mean income/needs ratio:							
First interview	2.51	2.87	2.35	1.22	1.39	2.58	1.72
Eighth interview	2.67	3.06	2.05	1.30	2.63	2.55	1.72
Percent change	6.5	6.6	-12.6	5.9	89.8	-1.3	0.0
Percent with income/needs ratio less than 1.00:							
First interview	21.4	12.1	21.3	56.2	47.9	20.5	39.7
Eighth interview	18.8	9.7	31.0	53.3	18.2	13.2	38.2
Percent change	-12.3	-19.8	45.6	-4.9	-62.0	-35.4	-3.9
Number (in thousands)	51,862	36,867	2,884	8,390	1,402	1,372	948

Focusing on the largest subgroup of children in single parent families, those living with their mother only throughout the panel, the relative income available to these children, by any of the measures, was less than one-half that of children in two-parent families. At both the beginning and the end of the panel, household and family income were only about 40 percent, per capita income 47 percent, and the income/needs ratio 43 percent that of children in stable, two-parent families. Because the decline in poverty was significant for children in two-parent families but not for those in mother-only families, the poverty rate for children living with their mother only increased from 4.6 to 5.5 times that of children in stable, two-parent situations between the beginning and the end of the panel. In sum, the average income of children in mother only families did not deteriorate relative to children in stable, two-parent families but there did appear to be an increase in income disparity between low-income children in the two family situations.

Table C makes clear that the economic hardship for children who experience the departure of their father from the household resulted from two different factors. One was the loss of income earned by the absent parent; the other was that children who made the transition into single-parent households were less well-off to begin with than their counterparts who did not make the transition.

At the first interview, children in two-parent families who subsequently experienced the departure of their father from the household had levels of economic

well-being that were only 82-83 percent those of children who remained in stable, two-parent situations. By the end of the panel, the household and family income of these children had dropped to 59 percent that for children in stable, two-parent families.

The measures which adjusted for change in family composition did not show as great a decline but per capita income was 70 percent and the income/needs ratio 67 percent that of children in two-parent families by the eighth interview. Roughly one-half of the gap in income/needs ratio between children who remained in two-parent situations and those who did not resulted from the departure of the father; the other one-half existed before the father left the household.

Measures of income which include all household members suggest an income advantage for children who subsequently moved from a single-parent to a two-parent situation, compared with children who remained with their mother only throughout the panel. At the first interview, monthly household income was \$231 higher, and per capita income \$90 higher, on average, for children whose mother would eventually be observed to remarry or reconcile than for those with a mother who remained a single parent throughout the panel. However, family income of these two groups of children was similar at the time of the first interview.

Because the family income measure excludes income from persons in the household who are unrelated to the child, the suggestion is that children living with single mothers who eventually remarry more often benefit from income from nonfamily members than do children with mothers who remain single parents for relatively

Table C. Ratio of Income of Children In One- or No-Parent Situations to Income, for Children Who Live with Two Parents Throughout the Panel at the First and Eighth Interviews

Income	Always two parents	Mother always present			Father always present	Neither parent present
		Father leaves	Mother only	"Father" enters		
Mean family income:						
First interview	\$2,834	0.828	0.400	0.411	0.859	0.570
Eighth interview	\$3,060	0.593	0.384	0.819	0.758	0.479
Mean household income:						
First interview	\$2,847	0.829	0.420	0.504	0.881	0.652
Eighth interview	\$3,073	0.593	0.406	0.788	0.767	0.529
Mean per capita income:						
First interview	\$649	0.817	0.470	0.609	0.954	0.689
Eighth interview	\$689	0.704	0.476	0.858	0.886	0.643
Mean income/needs ratio:						
First interview	2.83	0.819	0.427	0.483	0.900	0.598
Eighth interview	3.06	0.671	0.424	0.860	0.834	0.561
Percent with income/needs ratio less than 1.00:						
First interview	12.1	1.754	4.630	3.953	1.689	3.277
Eighth interview	9.7	3.184	5.491	1.873	1.362	3.925
Number (in thousands)	36,867	2,884	8,390	1,402	1,372	948

long periods. In some of these situations, this probably reflects the fact that the "father" that is "gained" may live with the child and contribute to the income of the household prior to the mother's actual remarriage. Family and household income are defined such that the income of an unmarried partner of a child's mother would be included in the household but not the family income assigned to the child. Children with single mothers who remarry also live in somewhat smaller households than children with mothers who are not observed to remarry. This results in higher per person income during the time these children spend in single parent families.

Differences prior to the family compositional change between children who remained with one parent throughout the panel and those who made a transition into a two-parent situation are also apparent when the focus shifts to reciprocity of child support and public transfer income. As summarized in table D, which provides information on the percentage of children whose mothers received child support from an absent father, AFDC, and food stamps during the reference period of the first and last interviews, children with a single mother who subsequently was observed to reconcile with an absent spouse or remarry were much more likely to benefit from child support payments from their absent father than were children whose mother remained the sole parent in the household throughout the survey.

At the time of the first interview, 35 percent of the former group compared with 22 percent of the latter group benefitted from child support payments. The "always mother only" group of children was much more likely than the group whose mother remarried to be with a mother who relied, at least in part, on AFDC and food stamps. Whereas 40 percent of the mothers of the former group received AFDC and 50 percent relied on

food stamps the comparable percentages for children with mothers who would remarry during the panel was 29 percent and 36 percent, respectively.

Similarly, at the eighth interview, 38 percent of children in families in which the father had been present at the first interview but subsequently left the household were benefiting from child support payments from an absent father compared with 26 percent of children who had lived with their mother only throughout the panel. On the other hand, 19 percent of the former group, compared with 42 percent of the latter group lived in households in which their mother relied in part on AFDC benefits. Food stamps were received by the mothers of 24 percent of the former group versus 47 percent of the latter group.

Two factors should be mentioned in connection with the estimates shown in table D. By the eighth interview, the father had returned to the household of some of the children who had experienced a separation from their father. Also, the "always mother only" group included an important subgroup whose mother had never married and, hence, whose mother probably had much more difficulty locating the absent father to collect child support. Never-married mothers also tend to be relatively young and lack education and employment experience, which increases the likelihood of reliance on public assistance income.

PARENTAL LABOR FORCE PARTICIPATION

The major component of income in most children's households is the earnings of their parents. Tables E and F focus on the employment and earnings of the mothers and fathers of children in various family situations at the time of the first interview. Parent's employment is classified according to whether the person was employed during all, some, or none of the weeks of the 4-month reference period for the first interview. Those who reported that they usually worked 35 hours or more in the weeks they were employed are classified as full-time workers.

Children whose fathers left the household subsequent to the first interview were somewhat more likely than children in stable, two-parent families to live with a mother who worked full-time, all weeks of the reporting period (32 versus 25 percent, respectively). Otherwise, the labor force participation and earnings of mothers did not differ greatly between these two groups of children.

The labor force participation of mothers who were single parents at the first interview but subsequently married (or reconciled) differed considerably from that of mothers who remained single parents throughout the panel. Children of a mother who subsequently was observed to remarry were more likely to have a mother who worked full-time during all weeks of the reference

Table D. Mother's Reciprocity of Child Support, AFDC, and Food Stamps Among Children Whose Mother is Present Throughout the Panel and Whose Father is Absent All or Part of the Panel

Benefit reciprocity	Mother always present		
	Father leaves	Mother only	"Father" enters
Percent receiving child support:			
First interview.....	12.7	21.6	34.7
Eighth interview.....	37.7	25.8	36.7
Percent receiving AFDC:			
First interview.....	5.3	39.9	29.0
Eighth interview.....	19.4	41.8	14.9
Percent receiving food stamps:			
First interview.....	9.4	50.3	36.1
Eighth interview.....	24.1	47.0	19.2
Numbers (in thousands)	2,834	8,390	1,402

Table E. Mother's Employment, Usual Weekly Hours, Earnings, and Personal Income at the First Interview

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Employment status (percent).....	100.0	100.0	100.0	100.0
Worked all weeks.....	39.5	38.0	35.3	50.4
35 or more hours.....	24.6	32.1	29.6	42.9
Less than 35 hours.....	14.9	5.9	5.7	7.6
Worked some weeks.....	14.0	17.8	10.6	11.9
35 or more hours.....	5.7	6.1	6.3	5.7
Less than 35 hours.....	8.3	11.7	4.3	6.2
Worked no weeks.....	46.5	44.2	54.1	37.6
Usual number of hours worked per week among those reporting hours.....	31.5	34.9	36.6	36.5
Percent reporting 1+ hours.....	56.7	57.3	49.6	64.7
Average monthly earnings among those reporting \$1 or more.....	838	860	916	954
Percent with earnings.....	54.1	54.7	49.2	63.1
Average monthly personal income among those reporting \$1 or more.....	666	743	845	934
Percent with income.....	80.4	79.2	95.7	95.4
Numbers (in thousands).....	36,887	2,884	8,390	1,402

period and were much less likely to have a mother who did not work at all than were children with a single mother who did not remarry.

Table F shows father's employment and earnings during the reference period for the first interview. Whereas 81 percent of children in stable, two-parent families had a father who worked full-time all weeks of the reporting period, the comparable percentage was only 67 percent for children whose fathers departed from the household during the subsequent 28 months. That is, labor force

attachment was more tenuous among fathers who left than among fathers who remained with their children throughout the panel. Although the vast majority of both groups of fathers provided earnings to their families during the reference period, the average monthly amount provided to children in stable, two-parent situations was 31 percent greater than for children living with a father who subsequently left the household (i.e., \$2,259 versus \$1,718, respectively.)

Tables G and H provide information on change in mother's labor force participation and earnings between the beginning and the end of the panel for children who lost or "gained" a father and for those who were either always with two parents or always with their mother only. Shown are estimates for the first and seventh interviews and for the second and eighth interviews.

The first and seventh interviews were both conducted in the months of October through December (of 1983 in the case of the first interview, 1985 in the case of the seventh interview). The reference period for reporting labor force participation spanned the months of June through December for both interviews. That is, a respondent who was first interviewed in October of 1983 reported labor force participation for June through September of 1983 at the first interview and for the same months of 1985 at the seventh interview. On the other hand, someone who was first interviewed in December of 1983 reported labor force participation from August through November at both the first and seventh interviews.

The reporting period for the eighth interview paralleled that for the second interview. The interviews were conducted between February and May and the reporting period for employment and earnings information was

Table F. Father's Employment, Usual Weekly Hours, Earnings, and Personal Income at the First Interview

Subject	Always two parents	Father leaves	Father always present
Employment status (percent).....	100.0	100.0	100.0
Worked all weeks.....	83.1	70.4	71.1
Full-time.....	80.8	67.1	66.9
Part-time.....	2.3	3.3	4.2
Worked some weeks.....	9.8	15.0	21.0
Full-time.....	8.7	12.0	18.5
Part-time.....	1.1	3.0	2.5
Worked no weeks.....	7.0	14.7	7.9
Usual number of hours worked per week among those reporting hours.....	45.5	44.4	44.6
Percent reporting 1+ hours.....	94.1	87.9	93.2
Average monthly earnings among those reporting \$1 or more.....	2,259	1,718	1,968
Percent with earnings.....	91.7	86.9	90.2
Average monthly personal income among those reporting \$1 or more.....	2,233	1,658	1,962
Percent with income.....	97.8	95.9	98.1
Numbers (in thousands).....	36,867	2,884	1,372

Table G. Changes in Mother's Employment and Usual Weekly Hours

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Percent working full time, all weeks:				
First interview	24.6	32.1	29.6	42.9
Seventh interview	30.4	43.1	34.3	38.2
Second interview	26.9	34.5	31.4	38.8
Eighth interview	32.6	41.2	34.0	41.0
Percent not working at all:				
First interview	46.5	44.2	54.1	37.6
Seventh interview	42.5	37.9	50.1	33.4
Second interview	46.4	43.3	53.7	38.8
Eighth interview	41.8	35.7	50.4	31.4
Percent reporting weekly hours:				
First interview	56.7	57.3	49.6	64.7
Seventh interview	60.1	64.9	52.8	70.9
Second interview	56.2	59.6	47.3	62.2
Eighth interview	60.6	65.1	51.5	73.7
Average weekly hours:				
First interview	31.5	34.9	36.6	36.5
Seventh interview	33.0	36.6	37.2	36.7
Second interview	31.7	35.2	36.7	36.8
Eighth interview	33.3	37.2	36.5	36.1
Number (in thousands)	36,867	2,884	8,390	1,402

October through April of 1983-84 for the second interview, 1985-86 for the eighth interview. Because the labor force participation of mothers might be seasonal, with mothers of school-age children arranging to work fewer hours or not at all during the summer months

when their children were not in school, it seemed advisable to include intermediate estimates for the second and seventh interviews so as not to exaggerate change in mother's labor force participation between the first and eighth interviews. The reference period for

Table H. Changes in Mother's Monthly Earnings and Personal Income

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Percent with earnings:				
First interview	54.1	54.7	49.2	63.1
Seventh interview	57.4	64.7	52.6	70.9
Second interview	53.9	58.3	46.9	60.0
Eighth interview	58.3	64.7	51.4	73.3
Average monthly earnings:				
First interview	838	860	916	954
Seventh interview	913	976	974	904
Second interview	877	878	977	1,017
Eighth interview	972	1,026	1,018	959
Percent with income:				
First interview	80.4	79.2	95.7	95.4
Seventh interview	82.2	94.6	98.3	93.6
Second interview	80.4	83.6	95.7	95.8
Eighth interview	82.4	96.2	97.6	92.1
Average monthly income:				
First interview	666	743	845	934
Seventh interview	738	1,002	892	915
Second interview	696	767	871	928
Eighth interview	789	1,057	904	963
Number (in thousands)	36,867	2,884	8,390	1,402

the first interview included summer months whereas the reference period for the eighth interview included only months in which children are typically enrolled in school.

The labor force attachment of children's mothers increased during the course of the panel. That is, the percentage of mothers who worked all weeks, full time increased and the percentage not working at all decreased among mothers of children in stable, two-parent families, families in which there was no major change in parental marital status. Children in the study aged by two and one third years during the course of the panel and mother's labor force participation tends to increase as children get older. Also, the overall labor force participation rate of married mothers with children under age 18 continued its upward trend during the time period covered by the 1984 SIPP panel.³

To the extent there is seasonality in mother's labor force participation that might affect comparisons between the first and eighth interviews, it seems to primarily affect the percentage working full time. The suggestion is that mothers may adjust the number of hours of employment downward but they do not leave the labor force in greater numbers during the summer than in other months of the year. Estimates of the percentage not working at all or reporting some weekly hours of participation and some earnings were virtually the same at the first and second interviews for mothers of children in stable, two-parent families.

Because differences among the groups of mothers compared in tables G and H existed at the time of the first interview, it is difficult to use the estimates to study the effect of a change in marital status, such as the loss of a spouse from the household, on mothers' employment and earnings. Comparisons of labor force behavior, earnings, and income between the beginning and the end of the panel leave open the question of whether changes that are observed occurred at the time of a family disruption or happened gradually over the period. In order to provide more precise estimates of the immediate and short-term changes in the economic situation of children which follow a separation from their father, the next section of this report focusses on the subgroup of children whose father departed from the household during the survey. Estimates of income, child support and welfare reciprocity, mother's labor force participation, and earnings for the interviews which occurred just prior to, at the time of, and immediately following the separation are shown so as to provide a better picture of the consequences for children of father absence.

ECONOMIC WELL-BEING BEFORE AND AFTER A PARENTAL SEPARATION

This section focuses on economic well-being of children who experienced a family disruption. The focus is on the path of change in the economic well-being of

children following family disruption and analysis is restricted to those children who made the transition from a two-parent to a mother only living arrangement at any point after the four months covered during the first interview.⁴ Well-being is measured for up to six time points surrounding the parental disruption: these include the interview prior to the parental loss; the interview at which the father was no longer present in the household; and four interviews, or time points, following the initial family disruption.

Children for whom the father's departure took place between the first and second interviews were observed once with both parents present, at a second point when the transition occurred, and six times after the initial family disruption. On the other hand, children for whom the parental separation occurred between the seventh and eighth interviews, were observed just prior to the parental separation, and for the reference period during which the separation occurred but for no further points after the initial disruption. Hence, the sample of children on which estimates are based decreases at each observation after the loss of the father from the household.⁵

At the time of the interview in which a father no longer was living in the child's household, monthly income was obtained for the preceding 4-month period. If the absent parent was present during at least part of that period, his income was included in the total family and household income amounts for those months in which he was present. Hence, the average monthly income shown in table I for the column labeled "At Time of Loss" does not capture the full economic impact of the departure of the father. For this reason, the more appropriate estimate of the decline in children's well-being immediately following a parental separation may be obtained by comparing income for the first full 4-month reporting period after the separation (column 1 under "After Loss of Parent") with income just prior to the parental separation.

The top panel of table I includes all children who experienced the loss of their father and the bottom panel is restricted to the subgroup of these children whose mother did not remarry or reconcile during the period of observation.⁶ The SIPP data suggest the family income available to children declined by about 37 percent following parental separation (from \$2,435 to \$1,543, on average). Changes in total family or household income may overstate the decline in economic

⁴The sample includes 417 children who lived with two parents at the first interview but who subsequently experienced the departure of their father from the household. Some children in two-parent families had a mother who left the household but the sample size was too small for analysis.

⁵Post-separation observations are restricted to four because of the declining sample size: 205 of the 417 children have information from at least four post-family disruption interviews.

⁶Of the sample of 417 children who experienced the departure of their father from the household, 315 lived with a mother who did not remarry or reconcile after the marital separation, and 139 of these children had at least four post-family disruption interviews.

³U.S. Department of Labor, Bureau of Labor Statistics, *Handbook of Labor Statistics*, Bulletin 2340 (issued August 1989), table 57.

Table I. Changes in Income Among Children Who Lived with Both Parents At the Beginning of the Panel and Whose Father Left in Subsequent Months

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
ALL CHILDREN						
Average monthly income:						
Family income	\$2,435	\$1,746	\$1,543	\$1,548	\$1,739	\$1,711
Household income	\$2,461	\$1,749	\$1,546	\$1,645	\$1,781	\$1,687
Per Capita income	\$549	\$449	\$436	\$447	\$468	\$456
Income/needs ratio	2.43	1.91	1.79	1.77	1.94	1.96
Percent in poverty	18.8	30.3	35.5	30.9	29.3	30.7
Ratio of income to income prior to loss:						
Family income	1.000	0.717	0.634	0.636	0.714	0.703
Household income	1.000	0.711	0.628	0.669	0.724	0.685
Per capita income	1.000	0.817	0.795	0.814	0.852	0.831
Income/needs ratio	1.000	0.787	0.737	0.729	0.801	0.805
Percent in poverty	1.000	1.617	1.892	1.646	1.564	1.635
Number (in thousands)	2,884	2,884	2,522	2,194	1,804	1,454
CHILDREN WHOSE MOTHER DOES NOT REMARRY/RECONCILE						
Average monthly income:						
Family income	\$2,416	\$1,735	\$1,452	\$1,364	\$1,424	\$1,432
Household income	\$2,450	\$1,732	\$1,451	\$1,459	\$1,465	\$1,395
Per capita income	\$540	\$445	\$424	\$409	\$409	\$399
Income/needs ratio	2.39	1.90	1.73	1.60	1.67	1.71
Percent in poverty	18.5	30.7	37.6	32.9	35.6	35.3
Ratio of income to income prior to loss:						
Family income	1.000	0.718	0.601	0.565	0.589	0.593
Household income	1.000	0.707	0.592	0.596	0.598	0.570
Per capita income	1.000	0.825	0.785	0.757	0.757	0.739
Income/needs ratio	1.000	0.796	0.723	0.670	0.699	0.714
Percent in poverty	1.000	1.660	2.029	1.780	1.922	1.905
Number (in thousands)	2,225	2,225	1,863	1,589	1,301	1,036

well-being for children, however, because family size also decreases. The two measures which adjust for changing household size indicate somewhat less hardship following family disruption than suggested by the decline in family income. Per capita income declined by 21 percent (from \$549 to \$436) and the income/needs ratio declined by 26 percent (from 2.43 to 1.79) after the loss of the father from the household.

Comparing the first and fourth observation following the disruption, points that are approximately 12 months apart, suggests that the income that is lost is not easily recouped. Family (and household) income at the time of the fourth interview after the family disruption was only 69-70 percent of the level prior to the disruption. Per capita income was 83 percent and the income needs ratio 81 percent of the level just prior to the father's departure.

The bottom panel of table 9 shows that those children whose mother does not remarry or reconcile quickly following parental marital separation have a particularly difficult time returning to levels of economic well-being that they enjoyed prior to their father's departure. At time 4 after the loss of their father, family

income of these children was only 59 percent what it was just prior to the separation. Per capita income was 74 percent and the income/needs ratio 71 percent that prior to the loss. Among this subgroup of children, the percentage in poverty doubled after the separation (from 19 to 38 percent) and remained at 35 percent by the fourth interview, roughly 16 months later.

Table J focuses on changes in the labor force participation of the mother of children whose father departs from the household. Just prior to the marital separation, one-third had a mother who worked full time, and 43 percent had a mother who was home full time. By time 1 after the loss, the percentage with a mother working full-time increased to 41 percent and the percentage with a mother not working at all dropped to 31 percent. The number reporting that they work some hours each week increased substantially (from 60 to 72 percent) but the average number of hours worked among those reporting hours increased only slightly from 34 to 37 hours per week. It also appears from table J that the labor force response of mothers, which is to a small degree an increase in working full-time but to a much larger degree a move from not working at all to

Table J. Changes In Mother's Employment After Departure of Father From the Household

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent working full-time, all weeks	33.4	36.9	41.2	43.8	43.4	41.9
Percent not working at all	43.4	34.8	31.0	38.7	36.6	39.1
Percent reporting weekly hours worked	60.3	67.9	72.1	63.3	65.8	62.1
Average weekly hours of those with hours ..	34.2	36.2	36.7	37.9	38.4	36.6
Number (in thousands)	2,884	2,884	2,522	2,194	1,804	1,454

working, is in part a temporary response. That is, the percentage of children with a mother who is not working at all decreased sharply from 43 to 31 percent between the interview prior to the departure of the father from the household and the interview which covers the first full 4-month reporting period in which he is absent from the household. However, 12 months later at time period 4 after the loss, the percentage of children with a mother who is not working at all rose to 39 percent. The percentage with mothers working full-time at time 4 after the father's departure (42 percent) was not appreciably different from the first time point after the separation. To summarize, it appears as if a subgroup of mothers who were in the labor force prior to their marital separation increased the number of hours they worked and this was more or less a permanent change.⁷ Another subgroup of mothers who were not working outside the home at the time of the marital split, and hence whose labor force attachment was probably more tenuous, may have sought employment in response to the marital break-up but were less successful at maintaining that labor force involvement over the next year or so.⁸

Changes in labor force participation of the subgroup of children whose mother did not remarry or reconcile before the end of the panel are shown in table K. The levels of participation and changes in participation parallel those of the larger group of children who experience father absence.

After a marital disruption, it is important to assess the extent to which a mother is able to recoup lost income from the father by increasing her own earnings and income, and/or by relying on child support payments or public assistance to partially compensate for the loss of income from the absent parent. Table L shows how the earnings and personal income of children's mothers changes around the time a father leaves the household. Also shown are changes in the percentage receiving child support, AFDC, and food stamps and the average monthly amount received per recipient. Table M provides the same information for the subgroup of children whose mother did not remarry or reconcile after the marital separation.

Mother's earnings. The percentage of children whose mother had some earnings increased dramatically between the interview prior to the father's departure and the first full 4-month period after the marital separation. The percentage with earnings increased from 59 to 72 percent but fell back to 62 percent by the fourth interview after the loss.

Among the subgroup of children whose mother did not remarry, average monthly earnings were also higher by the third (\$1,015) and fourth (\$1,025) reference

second, third, and fourth time periods after the disruption were not significantly different from the percentage working prior to the disruption.

Table K. Changes In Mother's Employment After Departure of Father From the Household Among Children Whose Mother Is Not Observed to Remarry/Reconcile During the Panel

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent working full-time, all weeks	30.6	37.1	42.4	44.5	47.3	42.5
Percent not working at all	45.5	35.0	29.8	39.3	34.2	39.7
Percent reporting weekly hours worked	58.2	67.1	73.5	63.2	68.1	62.0
Average weekly hours of those with hours ..	33.4	35.7	36.5	38.4	39.4	37.8
Number (in thousands)	2,225	2,225	1,863	1,589	1,301	1,036

Table L. Changes In Mother's Earnings, Personal Income, and Reciprocity of Child Support, AFDC, and Food Stamps After Departure of Father From the Household

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent with \$1 or more of earned income . . .	58.6	67.1	72.1	62.4	65.3	62.1
Average monthly earnings	\$930	\$910	\$900	\$985	\$982	\$989
Percent with \$1 or more of personal income . .	81.4	93.1	97.2	96.4	98.0	97.3
Average monthly income	\$828	\$974	\$1,053	\$1,008	\$1,014	\$979
Percent with \$1 or more in child support	15.7	34.3	43.5	40.9	39.8	36.7
Average monthly receipt	\$284	\$342	\$351	\$338	\$360	\$378
Percent with \$1 or more in AFDC income	9.0	16.1	18.2	21.3	22.0	21.9
Average monthly receipt	\$268	\$255	\$255	\$285	\$272	\$286
Percent with \$1 or more in food stamps	9.5	25.8	26.6	26.5	24.8	25.5
Average monthly receipt	\$170	\$139	\$188	\$181	\$185	\$183
Number (in thousands)	2,884	2,884	2,522	2,194	1,804	1,451

periods after the disruption than during the first (\$884) time period after the separation. For the total sample of children whose father left the household, the average earnings of employed mothers did not differ significantly among any of the time periods surrounding the disruption.

Mother's personal income. Prior to the departure of the father from the household, the mothers of 81 percent of children had some personal income amounting to \$828 per month, on average. By the first full time period after the father's departure, this percentage had climbed to 97 percent and the average amount stood at \$1,053. There was no decline in the percentage with personal income and the average amount received did not change significantly between the first and fourth time period after the separation.

Child support. At the interview prior to the marital separation, 16 percent of children were living with a mother who received child support. This suggests that some children in two-parent families were living with their mother and a step-father and it was their step-father who departed from the household in the subsequent time period. By time 1 after the loss of a father from the household, 44 percent of children benefited from child support payments which averaged \$351 a month. By the fourth time period after the father's departure, the percentage receiving child support and the average amount received had not changed significantly from the first time period after the separation.

The pattern of reciprocity was similar for the subgroup of children whose mother was not observed to remarry or reconcile except that the level of support provided in the second and third (but not the fourth) time period after the family disruption was significantly higher

Table M. Changes In Mother's Earnings, Personal Income, and Reciprocity of Selected Benefits After Departure of Father From the Household Among Children Whose Mothers Are Not Observed to Remarry/Reconcile During the Panel

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent with \$1 or more of earned income . . .	56.4	66.3	73.5	63.2	67.4	62.0
Average monthly earnings	\$934	\$924	\$884	\$994	\$1,015	\$1,025
Percent with \$1 or more of personal income . .	79.7	95.5	98.2	95.7	98.6	98.4
Average monthly income	\$810	\$962	\$1,075	\$1,070	\$1,043	\$1,060
Percent with \$1 or more in child support	14.3	35.3	46.3	44.1	40.9	42.5
Average monthly receipt	\$294	\$321	\$334	\$368	\$401	\$410
Percent with \$1 or more in AFDC income	11.7	18.9	19.4	23.6	24.4	25.8
Average monthly receipt	\$268	\$242	\$243	\$279	\$273	\$298
Percent with \$1 or more in food stamps	10.3	27.6	28.2	29.0	28.7	31.7
Average monthly receipt	\$187	\$150	\$187	\$177	\$194	\$186
Number (in thousands)	2,225	2,225	1,863	1,589	1,301	1,036

than the \$334 received in the first time period after separation.⁹ Among this subgroup of children, 43 percent benefited from support payments at time 4 after the separation, roughly 16 to 20 months after the father's departure from the household.

AFDC and Food stamps. The data on AFDC and food stamp reciprocity suggest that most of those who come to rely on these sources of income enroll in the programs fairly quickly after the family disruption. Nine percent of children were living with mother's who received AFDC payments prior to their marital separation and this doubled to 18 percent by the first complete time period after the separation. This percentage increased somewhat to 22 percent by the fourth time period after the father's departure.

Among the subgroup of children whose mother was not observed to remarry or reconcile, 12 percent received AFDC prior to the separation. This increased to 19 percent at time 1 and further to 26 percent by the fourth time period after the separation. The average amount received by these children's families was \$298 a month at the fourth time point after the separation.

There was a slightly higher probability that children would benefit from food stamps than from AFDC payments during the first time period after the marital disruption. Reciprocity of food stamps increased from 10 percent before the disruption to 27 percent at time 1 after the parental separation but then remained unchanged in subsequent time periods.

By the fourth time period after the separation, 32 percent of children whose mother had not remarried received food stamps and the average value of the food stamps received was \$186 a month. The percentage

receiving food stamps was considerably higher than before the separation but not significantly different from the percentage receiving food stamps in the first time period after the separation. The average monthly amount received was similar at each point in time.

SUMMARY

In this report, various short-term changes in the economic well-being of children following family disruption were estimated. Results suggest that family income available to children drops by 37 percent immediately following loss of a father. Per capita income and the income/needs ratio decrease somewhat less (by 21 and 26 percent, respectively), but remain at lower levels for some time.

The economic differences between children who experience family disruption and those who do not result from two factors: the economic hardship brought on by a father's departure and the fact that economic disadvantage tends to precede family disruption. The SIPP data make clear that children who experienced a parental marital disruption during the period were less well off at the beginning of the panel than those who continued to live in stable two-parent families. Fathers of the children who moved from a two-parent to a one-parent situation were more often unemployed or out of the labor force prior to the marital disruption than were fathers of children in stable two-parent families.

In addition, children who experienced a marital disruption during the period were better off after the disruption than those who were in one-parent families throughout the period. Similarly, children whose mothers were observed to remarry or reconcile during the panel were better off while they lived in single parent families than children who lived with their mother only throughout the panel. The former group was more likely than the latter group to benefit from child support from their absent father and less like to rely on AFDC payments or food stamps.

⁹The declining sample size upon which estimates for the fourth time period are based may account for the failure of the difference between the amount received in the first and fourth time periods to achieve statistical significance.

Appendix A. Overview of the SIPP Program

BACKGROUND

The Survey of Income and Program Participation (SIPP) provides a major expansion in the kind and amount of information available to analyze the economic situation of households and persons in the United States. The information supplied by this survey is expected to provide a better understanding of the level and changes in the level of well-being of the population and of how economic situations are related to the demographic and social characteristics of individuals. The data collected in SIPP will be especially useful in studying Federal transfer programs, estimating program cost and effectiveness, and assessing the effect of proposed changes in program regulations and benefit levels. Analysis of other important national issues such as tax reform, Social Security program costs, and national health insurance can be expanded and refined, based on the information from this new survey.

The first interviews in the SIPP took place in October 1983, nearly 8 years after the research and developmental phase, the Income Survey Development Program (ISDP), was initiated by the Department of Health, Education, and Welfare, in 1975. Between 1975 and 1980 extensive research was undertaken to design and test new procedures for collecting income and related socioeconomic data on a subannual basis and in a longitudinal framework. Much of the work centered around four experimental field tests that were conducted in collaboration with the Bureau of the Census to examine different concepts, procedures, questionnaires, and recall periods. Two of the tests were restricted to a small number of geographic sites; the other two were nationwide. In the first nationwide test, the 1978 Research Panel, approximately 2,000 households were interviewed. Because of the relatively small number of interviews, controlled experimental comparisons of alternatives were not possible; however, the panel did demonstrate that many new ideas and methods were feasible. It also laid a foundation for the largest and most complex test: the 1979 Research Panel. This panel consisted of a nationally representative sample of 8,200 households and provided a vehicle for feasibility tests and controlled experiments of alternative design features.

In the fall of 1981, virtually all funding for ISDP research and planning of the continuing SIPP program was deleted from the budget of the Social Security Administration. The loss of funding for fiscal year 1982

brought all work on the new survey to a halt. In fiscal year 1983, however, money for initiation of the new survey was allotted in the budget of the Bureau of the Census. Work began almost immediately in preparation for the survey start in October 1983. The design of the questionnaire for the first interview was similar in structure to that used in the 1979 ISDP panel study with two important exceptions. First, the reference period for the questions was extended from 3 months to 4 months in order to reduce the number of interviews and, therefore, lower costs. Second, the questions covering labor force activity were expanded in order to provide estimates that were closer, on a conceptual basis, to those derived from the Current Population Survey (CPS). The design also incorporated a number of other modifications resulting from experience with the 1979 pilot study.

SURVEY CONTENT

There are three basic elements contained in the overall design of the survey content. The first is a control card used to record basic social and demographic characteristics for each person in the household at the time of the initial interview. Because households are interviewed a total of 8 or 9 times, the card is also used to record changes in characteristics and to record the dates when persons enter or leave the household. Finally, during each interview, information on each source of income received and the name of each job or business is transcribed to the card so that this information can be used in the updating process in subsequent interviews.

The second major element of the survey content is the core portion of the questionnaire. The core questions are repeated at each interview and cover labor force activity, the types and amounts of income received during the 4-month period, and participation status in various programs. Some of the important elements of labor force activity are recorded separately for each week of the period. Income reciprocity and amounts are recorded on a monthly basis with the exception of amounts of property income (interest, dividends, rent, etc.). Data for these types are recorded as totals for the 4-month period. The core also contains questions covering attendance in postsecondary schools, private health insurance coverage, public or subsidized rental housing, low-income energy assistance, and school breakfast and lunch participation.

The third major element is the various supplements or topical modules that will be included during selected household visits. The topical modules cover areas that need not be examined every 4 months. Certain of these topical modules are considered to be so important that they are viewed as an integral part of the overall survey. Other topical modules have more specific and more limited purposes. No topical modules were included in the first or second waves of SIPP during the first year of the survey. (See the following section on sample design and table A-1 for definition of the term "wave.") The third wave topical module covered (1) educational attainment, (2) work history, and (3) health characteristics (including disability). The fourth wave topical module covered (1) assets and liabilities, (2) pension plan coverage, and (3) housing characteristics. The fifth wave topical module covered (1) child care, (2) child support agreements, (3) support for nonhousehold members, (4) program participation history, and (5) reasons for not working. The sixth wave topical module covered (1) earnings and benefits, (2) property income and taxes, and (3) education and training.

SAMPLE DESIGN

The SIPP sample design for the 1984 panel consists of about 26,000 housing units selected to represent the noninstitutional population of the United States. (See appendix C for more details on the procedures used to select the sample.) About 20,900 of these were occupied and eligible for interview. Table A-1 shows the sample design for the first panel of SIPP. Each household in the sample was scheduled to be interviewed at 4-month intervals over a period of 2 1/2 years beginning in October 1983. The reference period for the questions is the 4-month period preceding the interview. For example, households interviewed in October 1983 were asked questions for the months June, July, August, and September. This household was interviewed again in February 1984 for the October through January period. The sample households within a given panel are divided into four subsamples of nearly equal size. These subsamples are called rotation groups and one rotation group is interviewed each month. In general, one cycle of four interviews covering the entire sample, using the same questionnaire, is called a wave. This design was chosen because it provides a smooth and steady work load for data collection and processing.

A new panel of smaller size was introduced in February 1985 and has been introduced in February of each succeeding year. This overlapping design provides a larger sample size from which cross-sectional estimates can be made. The overlap also enhances the survey's ability to measure change by lowering the standard errors on differences between estimates for points in time.

Table A-1. Design of First SIPP Panel

Rotation	Wave	Interview month	Reference months
1	1	Oct. 83	Jun., Jul., Aug., Sept.(83)
2	1	Nov. 83	Jul., Aug., Sept., Oct.(83)
3	1	Dec. 83	Aug., Sept., Oct., Nov.(83)
4	1	Jan. 84	Sept., Oct., Nov., Dec.(83)
1	2	Feb. 84	Oct., Nov., Dec.(83), Jan.(84)
2	2	Mar. 84	Nov., Dec.(83), Jan., Feb.(84)
3	2	Apr. 84	Dec.(83), Jan., Feb., Mar.(84)
4	3	May 84	Jan., Feb., Mar., Apr.(84)
1	3	Jun. 84	Feb., Mar., Apr., May(84)
2	3	Jul. 84	Mar., Apr., May, Jun.(84)
3	3	Aug. 84	Apr., May, Jun., Jul.(84)
4	4	Sept. 84	May, Jun., Jul., Aug.(84)
1	4	Oct. 84	Jun., Jul., Aug., Sept.(84)
2	4	Nov. 84	Jul., Aug., Sept., Oct.(84)
3	4	Dec. 84	Aug., Sept., Oct., Nov.(84)
4	5	Jan. 85	Sept., Oct., Nov., Dec.(84)
1	5	Feb. 85	Oct., Nov., Dec.(84), Jan.(85)
2	5	Mar. 85	Nov., Dec.(84), Jan., Feb.(85)
3	5	Apr. 85	Dec.(84), Jan., Feb., Mar.(85)
4	6	May 85	Jan., Feb., Mar., Apr.(85)
1	6	Jun. 85	Feb., Mar., Apr., May (85)
2	6	Jul. 85	Mar., Apr., May, Jun.(85)
3	6	Aug. 85	Apr., May, Jun., Jul.(85)
4	7	Sept. 85	May, Jun., Jul., Aug.(85)
1	7	Oct. 85	Jun., Jul., Aug., Sept.(85)
2	7	Nov. 85	Jul., Aug., Sept., Oct.(85)
3	7	Dec. 85	Aug., Sept., Oct., Nov.(85)
4	8	Jan. 86	Sept., Oct., Nov., Dec.(85)
1	8	Feb. 86	Oct., Nov., Dec.(85), Jan.(86)
2	8	Mar. 86	Nov., Dec.(85), Jan., Feb.(86)
3	8	Apr. 86	Dec.(85), Jan., Feb., Mar.(86)
4	9	May 86	Jan., Feb., Mar., Apr.(86)
1	9	Jun. 86	Feb., Mar., Apr., May (86)
2	9	Jul. 86	Mar., Apr., May, Jun.(86)
3	9	Aug. 86	Apr., May, Jun., Jul.(86)

SURVEY OPERATIONS

Data collection operations are managed through the Census Bureau's 12 permanent regional offices. A staff of interviewers assigned to SIPP conduct interviews by personal visit each month with most interviewing completed during the first 2 weeks of that month. Completed questionnaires are transmitted to the regional offices where they undergo an extensive clerical edit before being entered into the Bureau's SIPP data processing system. Upon entering this processing system the data are subjected to a detailed computer edit. Errors identified in this phase are corrected and computer processing continues.

Two of the major steps of computer processing are the assignment of weights to each sample person and imputation for missing survey responses. The weighting procedures assure that SIPP estimates of the number of persons agree with independent estimates of the population within specified age, race, and sex categories.

The procedures also assure close correspondence with monthly CPS estimates of households. In almost all cases, a survey nonresponse is assigned a value in the imputation phase of processing. The imputation for missing responses is based on procedures generally referred to as the "hot deck" approach. This approach assigns values for nonresponses from sample persons who did provide responses and who have characteristics similar to those of the nonrespondents.

The longitudinal design of SIPP dictates that all persons 15 years old and over present as household members at the time of the first interview be part of the survey throughout the entire 2 1/2 year period. To meet this goal, the survey collects information useful in locating persons who move. In addition, field procedures were established that allow for the transfer of sample cases between regional offices. Persons moving within a 100-mile radius of an original sampling area

(a county or group of counties) are followed and continue with the normal personal interviews at 4-month intervals. Those moving to a new residence that falls outside the 100-mile radius of any SIPP sampling area are interviewed by telephone. The geographic areas defined by these rules contain more than 95 percent of the U.S. population.

Because most types of analysis using SIPP data will be dependent not on data for individuals but on groups of individuals (households, families, etc.), provisions were made to interview all "new" persons living with original sample persons (those interviewed in the first wave). These new sample persons entering the survey through contact with original sample persons are considered as part of the sample only while residing with the original sample person.

Appendix B. Definitions and Explanations

Population coverage. The estimates in this report are restricted to the civilian noninstitutional resident population of the United States and members of the Armed Forces living off post or with their families on post.

Race. The population is divided into three groups on the basis of race: White, Black, and "other races." The last category includes American Indians, Asian/Pacific Islanders, and any other race except White and Black.

Hispanic origin. Persons of Hispanic origin were determined on the basis of a question that asked for self-identification of the person's origin (or the origin of some other household member) from a "flashcard" listing ethnic origins. Hispanics were those who indicated that their origin was Mexican, Puerto Rican, Cuban, Central or South American, or some other Hispanic origin. It should be noted that persons of Hispanic origin may be of any race.

Children. Children in this report refer to all persons under 15 years old in interviewed households at the beginning of the 1984 SIPP Panel and for whom 32 months of data were collected.

Parent. "Parent" includes step-, adoptive, as well as biological parents. Interviewers were instructed to identify the mother, if she was a household member, otherwise the father as the "parent" of the child. If the identified parent at a given interview was married and living with a spouse, the child was considered to be living with two parents. The sex of the identified parent and spouse was used to determine whether a child lived with his or her mother, and/or father at the first and subsequent interviews.

Living arrangements during the panel. In tables A and B of this report, children are divided into six mutually exclusive subgroups based on their family living arrangements during the panel. Those defined as "always two parents" lived with a parent and that parent's spouse at the first interview and continuously resided with these same two individuals throughout the panel. Those defined as "mother always present, father leaves" resided with the same female parent at each of the eight interviews but did not have a male parent present in the household at one or more of the interviews subsequent to the first interview. The "mother only group" resided with a

female parent at each of the eight interviews but that female parent did not have a spouse present in the household at any point during the survey. The "father enters group" resided with the same female parent throughout the survey. That female parent did not have a spouse living in the household at the first interview but had an identified spouse present in the household at one or more subsequent interviews. The residual group of children who did not continuously live with a female parent throughout the survey were subdivided into two groups: those who lived with a male parent at the first interview and continued to reside with that same parent at each subsequent interview and all other children (i.e., those who either never lived with a parent or who experienced a break in living with both their mother and their father).

Household. A household consists of all the persons who occupy a housing unit. A house, an apartment or other group of rooms, or a single room, is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall.

A household includes the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated persons sharing a housing unit as partners, is also counted as a household. The count of households excludes group quarters.

Family. A family is a group of two persons or more (one of whom is the householder) related by birth, marriage, or adoption and residing together; all such persons (including related subfamily members) are considered as members of one family.

Income. The cash income concept used in this report includes the sum of all income received from any of the sources listed in table B-1. Rebates, refunds, loans and capital gain or loss amounts from the sale of assets, and interhousehold transfers of cash such as allowances are not included.

Accrued interest on Individual Retirement Accounts, KEOGH retirement plans, and U.S. Savings bonds are also excluded. This definition differs somewhat from

that used in the annual income reports based on the March CPS income supplement questionnaire. The data in those reports, published in the Current Population Reports, Series P-60, are based only on income received in a regular or periodic manner and, therefore, exclude lump-sum or onetime payments, such as inheritances, or insurance settlements which are included as income in SIPP. Educational assistance, which is included in the March CPS income concept, is not included in the SIPP income concept.

The income amounts represent amounts actually received during the month, before deductions for income and payroll taxes, union dues, Part B Medicare premiums, etc.

While the income amounts from most sources are recorded monthly for the 4-month reference period, property income amounts such as interest, dividends, and rental income, were recorded as totals for the 4-month period. These totals were distributed equally between months of the reference period for purposes of calculating poverty status in this report.

Earnings. The SIPP income definition includes three types of earnings: wages and salary, nonfarm self-employment, and farm self-employment. The definition of nonfarm self-employment and farm self-employment is not based on the net difference between gross receipts or sales and operating expenses, depreciation, etc. The monthly amounts for these income types are based on the salary or other income received from the business by the owner of the business or farm during the 4-month period. Earnings from all jobs and self-employment are included.

Poverty definition. The poverty definition used in this report is based on the government's official definition but was calculated on a monthly basis using the family

composition at that time rather than fixing it throughout the year as is done in the Current Population Survey. These data differ from the official figures and are not part of the standard data series on poverty established by Directive 14 from the Office of Management and Budget. Official figures are published annually from the March Current Population Survey in the P-60 series of Current Population Reports.

The poverty definition is based on an index developed at the Social Security Administration in 1964 and revised by Federal interagency committees in 1969 and 1981. The poverty concept is a statistical measure based on the Department of Agriculture's 1961 Economy Food Plan. It reflects the different consumption requirements of families in relation to their size and composition, and the age of the family householder. A ratio of food expenditures to income of one-third, based on the Department of Agriculture's 1955 Survey of Food Consumption, was used to derive the original poverty thresholds from the economy food plan. The poverty thresholds have been updated annually based on changes in the Consumer Price Index.

Symbols. A dash (—) represents zero or rounds to zero, "B" means that the base for the derived figure is less than 200,000, and "X" means not applicable.

Rounding. Percentages are rounded to the nearest tenth of a percent; therefore, the percentages in a distribution do not always add to exactly 100.0 percent. The totals, however, are always shown as 100.0. Moreover, individual figures are rounded to the nearest thousand without being adjusted to group totals, which are independently rounded; percentages are based on the unrounded numbers.

Table B-1. Income Sources Included in Monthly Cash Income

Earnings from Employment	Employer or union temporary sickness policy
Wages and salary	Payments from a sickness, accident, or disability insurance policy purchased on your own
Nonfarm self-employment income	Aid to Families with Dependent Children (AFDC), (ADC)
Farm self-employment income	General assistance or General relief
Income from Assets (Property Income)	Indian, Cuban, or Refugee assistance
Regular/passbook savings accounts in a bank, savings and loan or credit union	Foster child care payments
Money market deposit accounts	Other welfare
Certificate of deposit or other savings certificates NOW, Super NOW, or other interest-earning checking accounts	Child support payments
Money market funds	Alimony payments
U.S. Government securities	Pensions from a company or union
Municipal or corporate bonds	Federal Civil Service or other Federal civilian employee pensions
Other interest-earning assets	U.S. Military retirement
Stocks or mutual fund shares	National Guard or Reserve Forces retirement
Rental property	State government pensions
Mortgages	Local government pensions
Royalties	Income from paid-up life insurance policies or annuities
Other financial investments	Estates and trusts
Other Income Sources	Other payments for retirement, disability or survivors, G.I. Bill/VEAP education benefits
Social Security	Income assistance from a charitable group
U.S. Government Railroad Retirement	Other unemployment compensation (Trade Adjustment Act benefits, strike pay, other)
Federal Supplemental Security	Veterans' compensation or pensions
State Administered Supplemental Security income	Money from relatives or friends
State unemployment compensation	Lump sum payments
Supplemental Unemployment Benefits	Income from roomers or boarders
Black Lung payments	National Guard or Reserve pay
Worker's compensation	Incidental or casual earnings
State temporary sickness or disability benefits	Other cash income not included elsewhere

Appendix C. Source and Accuracy of Estimates

SOURCE OF DATA

The data for the longitudinal estimates provided in the report are obtained from eight interviews of the 1984 panel of the Survey of Income and Program Participation (SIPP). The SIPP universe is the noninstitutionalized resident population living in the United States. This population includes persons living in group quarters, such as dormitories, rooming houses, and religious group dwellings. Crew members of merchant vessels, Armed Forces personnel living in military barracks, and institutionalized persons, such as correctional facility inmates and nursing home residents, were not eligible to be in the survey. Also, United States citizens residing abroad were not eligible to be in the survey. Foreign visitors who work or attend school in this country and their families were eligible; all others were not eligible. With the exceptions noted above, persons who were at least 15 years of age at the time of the interview were eligible to be interviewed in the survey.

1984 SIPP Panel. The 1984 panel SIPP sample is located in 174 areas comprising 450 counties (including one partial county) and independent cities. Within these areas, clusters of two to four living quarters (LQ's) were systematically selected from lists of addresses prepared for the 1970 decennial census to form the bulk of the sample. In addition, the sample was updated to account for new residential construction since the 1970 census.

In jurisdictions that do not issue building permits, small land areas were sampled and the LQ's within were listed by field personnel and then subsampled. In addition, sample LQ's were selected from a supplemental frame that included LQ's identified as missed in the 1980 census and group quarters.

The first cycle (i.e., wave) of interviewing of this panel was conducted during October, November, and December 1983, and January 1984. Approximately one-fourth of the sample was interviewed in each of these months. Each sample person was visited every 4 months thereafter. At each interview the reference period was the 4 months preceding the interview month.

Approximately 26,000 LQ's were originally designated for the sample. At the first contact, interviews were obtained from the occupants of about 19,900 of the 26,000 designated LQ's. Most of the remaining 6,100 LQ's were found to be vacant, demolished,

converted to nonresidential use, or otherwise ineligible for the survey. However, approximately 1,000 of the 6,100 LQ's were not interviewed because the occupants refused to be interviewed, could not be found at home, were temporarily absent, or were otherwise unavailable. Thus, occupants of about 95 percent of all eligible LQ's participated in the first interview of the survey.

For subsequent interviews, only original sample persons (those interviewed in the first interview) and persons living with them were eligible to be interviewed. Original sample persons were followed if they moved to a new address, unless the new address was more than 100 miles from a SIPP sample area. Then, telephone interviews were attempted. All first interview noninterviewed households were automatically designated as noninterviews for all subsequent interviews. When original sample persons moved to remote parts of the country, moved without leaving a forwarding address or refused to be interviewed, additional interviews resulted.

A person was classified as interviewed or noninterviewed for the panel based on the following definitions. Interviewed sample persons were defined to be 1) those for whom self or proxy responses were obtained for each reference month of all eight interviews or 2) those for whom self or proxy responses were obtained for the first reference month of the panel and for each subsequent reference month until they were known to have died or moved to an ineligible address (foreign living quarters, institutions, or military barracks). Noninterviewed sample persons were defined to be everyone else.

ESTIMATION

Several stages of weight adjustments were involved in the estimation procedure used to derive the SIPP longitudinal person weights. Each person received a base weight equal to the inverse of his/her probability of selection. Two noninterview adjustment factors were applied. One adjusted the weights of interviewed persons in interviewed households to account for households which were eligible for the sample but could not be interviewed at the first interview. The second was applied to compensate for person noninterviews occurring in subsequent interviews. The Bureau has used complex techniques to adjust the weights for nonresponse, but the success of these techniques in avoiding

bias is unknown. Another factor was applied to each interviewed person's weight to account for the SIPP sample areas not having the same population distribution as the strata from which they were selected.

An additional stage of adjustment to longitudinal person weights was performed to reduce the mean square error of the survey estimates. This was accomplished by bringing the sample estimates into agreement with monthly Current Population Survey (CPS) type estimates of the civilian (and some military) noninstitutional population of the United States by demographic characteristics including age, sex, race, and Hispanic ethnicity as of the specified control date. The CPS estimates by age, race, sex, and Hispanic origin were themselves brought into agreement with estimates from the 1980 decennial census which have been adjusted to reflect births, deaths, immigration, emigration, and changes in the Armed Forces since 1980.

ACCURACY OF ESTIMATES

SIPP estimates are based on a sample; they may differ somewhat from the figures that would have been obtained if a complete census had been taken using the same questionnaire, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey: nonsampling and sampling. We are able to provide estimates of the magnitude of SIPP sampling error, but this is not true of nonsampling error. Found in the next sections are descriptions of sources of SIPP nonsampling error, followed by a discussion of sampling error, its estimation, and its use in data analysis.

Nonsampling Variability. Nonsampling errors can be attributed to many sources, e.g., inability to obtain information about all cases in the sample, definitional difficulties, differences in the interpretation of questions, inability or unwillingness on the part of the respondents to provide correct information, inability to recall information, errors made in collection such as in recording or coding the data, errors made in processing the data, errors made in estimating values for missing data, biases resulting from the differing recall periods caused by the interviewing pattern used, and failure of all units in the universe to have some probability of being selected for the sample (undercoverage). Quality control and edit procedures were used to reduce errors made by respondents, coders and interviewers.

Undercoverage in SIPP results from missed living quarters and missed persons within sample households. It is known that undercoverage varies with age, race, and sex. Generally, undercoverage is larger for males than for females and larger for Blacks than for non-Blacks. Ratio estimation to independent age-race-sex population controls partially corrects for the bias

due to survey undercoverage. However, biases exist in the estimates to the extent that persons in missed households or missed persons in interviewed households have characteristics different from those of interviewed persons in the same age-race-sex group. Further, the independent population controls used have not been adjusted for undercoverage.

Comparability with Other Estimates. Caution should be exercised when comparing data from this report with data from other SIPP publications or with data from other surveys. The comparability problems are caused by such sources as the seasonal patterns for many characteristics, different nonsampling errors, and different concepts and procedures.

Sampling Variability. Standard errors indicate the magnitude of the sampling error. They also partially measure the effect of some nonsampling errors in response and enumeration, but do not measure any systematic biases in the data. The standard errors for the most part measure the variations that occurred by chance because a sample rather than the entire population was surveyed.

USES AND COMPUTATION OF STANDARD ERRORS

Confidence Intervals. The sample estimate and its standard error enable one to construct confidence intervals, ranges that would include the average result of all possible samples with a known probability. For example, if all possible samples were selected, each of these being surveyed under essentially the same conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then:

1. Approximately 68 percent of the intervals from one standard error below the estimate to one standard error above the estimate would include the average result of all possible samples.
2. Approximately 90 percent of the intervals from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate would include the average result of all possible samples.
3. Approximately 95 percent of the intervals from two standard errors below the estimate to two standard errors above the estimate would include the average result of all possible samples.

The average estimate derived from all possible samples is or is not contained in any particular computed interval. However, for a particular sample, one can say with a specified confidence that the average estimate derived from all possible samples is included in the confidence interval.

Hypothesis Testing. Standard errors may also be used for hypothesis testing, a procedure for distinguishing between population characteristics using sample estimates. The most common types of hypotheses tested are (1) the population characteristics are identical versus (2) they are different. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the characteristics are different when, in fact, they are identical.

All statements of comparison in the report have passed a hypothesis test at the 0.10 level of significance or better. This means that, for differences cited in the report, the estimated absolute difference between parameters is greater than 1.6 times the standard error of the difference.

To perform the most common test, compute the difference $X_A - X_B$, where X_A and X_B are sample estimates of the characteristics of interest. A later section explains how to derive an estimate of the standard error of the difference $X_A - X_B$. Let that standard error be s_{DIFF} . If $X_A - X_B$ is between -1.6 times s_{DIFF} and +1.6 times s_{DIFF} , no conclusion about the characteristics is justified at the 10 percent significance level. If, on the other hand, $X_A - X_B$ is smaller than -1.6 times s_{DIFF} or larger than +1.6 times s_{DIFF} , the observed difference is significant at the 10 percent level. In this event, it is commonly accepted practice to say that the characteristics are different. Of course, sometimes this conclusion will be wrong. When the characteristics are, in fact, the same, there is a 10 percent chance of concluding that they are different.

Note that as more tests are performed, more erroneous significant differences will occur. For example, at the 10 percent significance level, if 100 independent hypothesis tests are performed in which there are no real differences, it is likely that about 10 erroneous differences will occur. Therefore, the significance of any single test should be interpreted cautiously.

Note Concerning Small Estimates and Small Differences. Summary measures are shown in the report only when the base is 200,000 or greater. Because of the large standard errors involved, there is little chance that estimates will reveal useful information when computed on a base smaller than 200,000. Also, nonsampling error in one or more of the small number of cases providing the estimate can cause large relative error in that particular estimate. Estimated numbers are shown, however, even though the relative standard errors of these numbers are larger than those for the corresponding percentages. These smaller estimates are provided primarily to permit such combinations of the categories as serve each user's needs. Therefore, care must be taken in the interpretation of small differences since even a small amount of nonsampling error can cause a borderline difference to appear significant or not, thus distorting a seemingly valid hypothesis test.

Standard Error Tables and Their Use. Most SIPP estimates have greater standard errors than those obtained through a simple random sample because clusters of living quarters are sampled for the SIPP. The Census Bureau created generalized variance parameters (denoted as "a" and "b") for use in the calculation of 1984 longitudinal panel estimates. However, for this report, the parameters were not used. Instead, the author used a variance generating program called VPLX, written by Robert Fay of the Census Bureau. VPLX was used to calculate the standard errors independently of Bureau estimates through the use of replication methods. The tables of standard errors are provided at the end of the report for user convenience. For example, standard errors for table B are provided in table C-2.

In using VPLX to calculate standard errors, individual correlations between related items were also calculated and used to estimate the standard errors of differences. Due to space limitations we are not providing the correlations in this document. (If users wish to obtain correlations for specific items call Suzanne Bianchi at (301) 763-8354.

As a result, the user may generate estimates that are not exactly the same as those given in the text.

Standard Error of a Difference. The standard error of a difference between two sample estimates, x and y , is equal to

$$s_{(x-y)} = \sqrt{s_x^2 + s_y^2} \quad (1)$$

where s_x and s_y are the standard errors of the estimates x and y . The estimates can be numbers, averages, percents, ratios, etc. The above formula assumes that the correlation coefficient, r , between the characteristics estimated by x and y is zero. If r is really positive (negative), then this assumption will result in a tendency towards overestimates (underestimates) of the true standard error.

If users obtain the correlation coefficient between the characteristics estimated by x and y , the standard error of a difference is estimated by

$$s_{(x-y)} = \sqrt{s_x^2 + s_y^2 - 2rs_xs_y} \quad (2)$$

Illustration. Table D of the report shows that in the eighth interview 24.1 percent of children whose father left during the panel received food stamps and 47.0 percent of children who lived with their mother only received food stamps. Using table C-4, the standard errors of these percentages are approximately 3.46 percent and 2.14 percent respectively.

The standard error of the difference is computed using formula (1):

$$\sqrt{(3.46)^2 + (2.14)^2} = 4.1 \text{ percent}$$

Suppose that it is desired to test at the 10 percent significance level whether the above two percentages differ significantly. To perform the test, compare the

difference of 22.9 percent to the product of $1.6 \times 4.1 = 6.6$ percent. Since the difference is larger than 1.6 times the standard error of the difference, the data supports the hypothesis that the two percent estimates are significantly different at the 10 percent level.

Standard Errors of Ratios of Means and Medians.

The standard error for a ratio of means or medians is approximated by:

$$s_{\frac{x}{y}} = \sqrt{\left(\frac{x}{y}\right)^2 \left[\left(\frac{s_y}{y}\right)^2 + \left(\frac{s_x}{x}\right)^2 \right]} \quad (3)$$

where x and y are means or medians, and s_x and s_y are their associated standard errors. Formula 3 assumes that the means or medians are not correlated. If the correlation between the population means or medians

estimated by x and y are actually positive (negative), then this procedure will tend to produce overestimates (underestimates) of the true standard error for the ratio of means or medians.

Illustration. Suppose the SIPP estimate of "Mother only" to "Always two parents" mean family income at the first interview is 0.40. Also, suppose that the mean family income and its standard error are \$1,132 and \$49, respectively, for "Mother only" families, and \$2,834 and \$56, respectively, for "Always two parent" families.

Using formula (3), the standard error of this ratio is approximated by:

$$s_{\frac{x}{y}} = \sqrt{\left(\frac{1132}{2834}\right)^2 \left[\left(\frac{49}{1132}\right)^2 + \left(\frac{56}{2834}\right)^2 \right]} = 0.019$$

Table C-1. **Standard Errors of Percentages of Children's Household Living Arrangements at the Beginning of the 1984 SIPP Panel and During the Panel, by Race**

Living arrangement	Total	White	Black	Hispanic ¹
BEGINNING OF PANEL				
Two parents	0.98	0.76	3.07	3.01
Mother only	0.91	0.72	3.13	3.09
Father only	0.19	0.18	0.54	0.46
Neither parent	0.16	0.14	0.71	0.55
EXPERIENCE DURING PANEL				
Always two parents present	0.99	0.97	3.09	2.97
Mother always present, father absent all or part of panel	0.80	0.80	3.01	3.02
Father leaves household	0.35	0.41	0.89	1.06
Always mother only	0.76	0.57	3.01	2.72
"Father" enters household	0.26	0.28	0.89	1.10
Father always present, mother absent all or part of panel	0.31	0.34	0.58	0.92
Neither parent all or part of panel	0.22	0.18	0.73	0.65
Number (in thousands)	42,171	42,171	7,943	4,943

¹ Persons of Hispanic origin may be of any race.

Table C-2. Standard Errors of Estimates of Average Monthly Income (Constant Dollars) in First and Eighth Interviews, by Living Arrangements During the Panel

Income and interview	Total children	Always two parents	Mother always present			Father always present	Neither parent present
			Father leaves	Mother only	"Father enters"		
Mean family income:							
First interview	\$44	\$56	\$129	\$49	\$70	\$198	\$132
Eighth interview	34	44	131	46	182	131	131
Percent change	1.34	1.52	4.89	3.32	15.50	5.88	5.83
Mean household income:							
First interview	\$44	\$56	\$129	\$52	\$96	\$204	\$151
Eighth interview	33	46	135	45	169	137	128
Percent change	1.36	1.56	4.75	3.38	13.10	5.74	4.17
Mean per capita income:							
First interview	\$10	\$13	\$34	\$12	\$28	\$46	\$36
Eighth interview	8	11	35	12	45	30	37
Percent change	1.31	1.43	4.33	2.45	8.25	5.00	5.61
Mean income/needs ratio:							
First interview	0.043	0.057	0.144	0.048	0.088	0.186	0.133
Eighth interview	0.034	0.047	0.141	0.049	0.189	0.120	0.156
Percent change	1.31	1.43	4.59	2.66	10.77	4.73	7.85
Percent with income/needs ratio less than 1.00							
First interview	0.93	0.84	4.65	2.58	4.65	3.96	5.82
Eighth interview	0.69	0.67	4.01	1.91	3.12	3.34	6.25
Percent change	2.52	5.14	26.26	3.40	6.42	19.42	11.19
Number (in thousands)	51,862	36,867	2,884	8,390	1,402	1,372	948

Table C-3. Standard Errors of Estimates of the Ratio of Income of Children in One- or No- Parent Situations to Income for Children Who Live with Two Parents Throughout the Panel at the First and Eighth Interviews

Income	Mother always present			Father always present	Neither parent present
	Father leaves	Mother only	"Father" enters		
Mean family income:					
First interview	0.046	0.017	0.025	0.068	0.047
Eighth interview	0.042	0.016	0.059	0.043	0.043
Mean household income:					
First interview	0.046	0.019	0.032	0.068	0.054
Eighth interview	0.044	0.015	0.054	0.045	0.042
Mean per capita income:					
First interview	0.052	0.017	0.040	0.071	0.055
Eighth interview	0.050	0.017	0.063	0.044	0.054
Mean income/needs ratio:					
First interview	0.050	0.016	0.031	0.064	0.047
Eighth interview	0.045	0.016	0.061	0.041	0.051
Percent with income/needs ratio less than 1.00:					
First interview	0.401	0.348	0.419	0.342	0.494
Eighth interview	0.447	0.398	0.343	0.341	0.696
Number (in thousands)	2,884	8,390	1,402	1,372	948

Table C-4. Standard Errors of Estimates of Mother's Reciprocity of Child Support, AFDC, and Food Stamps Among Children Whose Mother is Present Throughout the Panel and Whose Father is Absent All or Part of the Panel

Receipt of benefits	Mother always present		
	Father leaves	Mother only	"Father" enters
Percent receiving child support:			
First interview	3.21	2.03	5.97
Eighth interview	3.99	2.19	6.90
Percent receiving AFDC:			
First interview	2.06	1.98	4.73
Eighth interview	3.47	2.59	4.04
Percent receiving Food Stamps:			
First interview	2.30	2.15	4.09
Eighth interview	3.46	2.14	3.20
Numbers (in thousands)	2,884	8,390	1,402

Table C-5. Standard Errors of Estimates of Mother's Employment, Usual Weekly Hours, Earnings, and Personal Income at the First Interview

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Employment status (percent):				
Worked all weeks	1.20	3.77	2.13	5.34
35 or more hours	1.14	3.95	2.00	4.65
Less than 35 hours	0.64	1.15	1.08	3.73
Worked some weeks	0.87	2.54	1.33	3.08
35 or more hours	0.52	1.26	1.00	1.98
Less than 35 hours	0.63	2.50	1.25	2.15
Worked no weeks	1.25	3.79	2.40	4.95
Usual number of hours worked per week among those reporting hours	0.52	0.94	0.84	1.46
Percent reporting 1+ hours	1.2	3.6	2.5	5.0
Average monthly earnings among those reporting \$1 or more	\$22	\$53	\$34	\$88
Percent with earnings	1.1	3.4	2.4	4.8
Average monthly personal income among those reporting \$1 or more	\$18	\$54	\$30	\$65
Percent with income	1.1	3.5	1.0	2.0
Numbers (in thousands)	36,887	2,884	8,390	1,402

Table C-6. Standard Errors of Estimates of Father's Employment, Usual Weekly Hours, Earnings and Personal Income at the First Interview

Subject	Always two parents	Father leaves	Father always present
Employment status (percent):			
Worked all weeks	0.91	4.27	4.40
Full time	0.98	3.86	4.27
Part time	0.30	1.20	2.20
Worked some weeks	0.65	2.49	4.48
Full time	0.63	2.21	4.26
Part -time	0.20	1.11	1.66
Worked no weeks	0.62	3.90	2.45
Usual number of hours worked per week among those reporting hours.	0.24	0.91	1.31
Percent reporting 1+ hours	94.1	87.9	93.2
Average monthly earnings among those reporting \$1 or more	\$46	\$98	\$165
Percent with earnings	0.6	4.1	2.5
Average monthly personal income among those reporting \$1 or more ..	\$44	\$99	\$162
Percent with income	0.4	1.6	1.0
Number (in thousands)	36,867	2,884	1,372

Table C-7. Standard Errors of Estimates of Mother's Employment and Usual Weekly Hours, Beginning and End of the Panel

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Percent working full time, all weeks:				
First interview	1.14	3.95	2.00	4.65
Seventh interview	0.97	3.73	2.06	4.09
Second interview	1.05	3.18	1.90	4.55
Eighth interview	1.15	4.05	2.18	4.24
Percent not working at all:				
First interview	1.25	3.79	2.40	4.95
Seventh interview	1.26	4.11	2.35	4.19
Second interview	1.29	3.27	2.02	6.05
Eighth interview	1.09	3.71	1.96	4.31
Percent reporting weekly hours:				
First interview	1.21	3.62	2.48	4.95
Seventh interview	1.22	4.30	2.12	4.39
Second interview	1.32	3.30	2.18	6.12
Eighth interview	1.14	3.56	1.94	3.58
Average weekly hours:				
First interview	0.52	0.94	0.84	1.46
Seventh interview	0.40	0.72	0.60	0.92
Second interview	0.49	0.98	0.69	1.26
Eighth interview	0.41	0.72	0.54	1.30
Number (in thousands)	36,867	2,884	8,390	1,402

Table C-8. Standard Errors of Estimates of Mother's Average Monthly Earnings and Personal Income, Beginning and End of Panel

Subject	Always two parents	Mother always present		
		Father leaves	Mother only	"Father" enters
Percent with earnings:				
First interview	1.10	3.43	2.43	4.81
Seventh interview	1.18	4.32	2.12	4.39
Second interview	1.28	3.31	2.11	5.79
Eighth interview	1.06	3.56	1.97	3.68
Average monthly earnings:				
First interview	\$22	\$53	\$34	\$88
Seventh interview	\$25	\$46	\$32	\$69
Second interview	\$23	\$41	\$29	\$85
Eighth interview	\$26	\$54	\$29	\$72
Percent with income:				
First interview	1.14	3.45	1.02	1.98
Seventh interview	0.81	2.09	0.43	2.19
Second interview	1.12	3.58	0.96	1.87
Eighth interview	0.76	1.66	0.63	2.30
Average monthly income:				
First interview	\$18	\$54	\$30	\$65
Seventh interview	\$19	\$57	\$30	\$70
Second interview	\$18	\$48	\$34	\$72
Eighth interview	\$19	\$56	\$31	\$66
Number (in thousands)	36,867	2,884	8,390	1,402

Table C-9. Standard Errors of Estimates of Income Prior, At Time of, and After Parental Loss Among Children Who Lived With Both Parents At the Beginning of the Panel and Whose Father Left in Subsequent Months

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Average monthly income:						
Family income	\$114	\$128	\$135	\$88	\$139	\$130
Household income	115	125	122	103	141	128
Per capita income	32	34	36	29	34	30
Income/needs ratio	0.132	0.149	0.161	0.017	0.149	0.140
Percent in poverty	3.42	3.86	4.36	4.17	4.42	4.83
Ratio of income to income prior to loss:						
Family income		0.038	0.046	0.036	0.050	0.046
Household income		0.034	0.040	0.040	0.051	0.046
Per capita income		0.031	0.043	0.047	0.060	0.051
Income/needs ratio		0.036	0.047	0.041	0.055	0.048
Percent in poverty		0.214	0.254	0.254	0.306	0.264
Number (in thousands)	2,884	2,884	2,522	2,194	1,804	1,454
CHILDREN WHOSE MOTHER DOES NOT REMARRY/RECONCILE						
Average monthly income:						
Family income	\$127	\$140	\$158	\$90	\$127	\$124
Household income	130	139	143	103	124	116
Per Capita income	32	35	40	28	36	36
Income/needs ratio	0.133	0.156	0.183	0.106	0.158	0.158
Percent in poverty	3.53	4.27	4.73	4.68	4.62	5.61
Ratio of income to income prior to loss:						
Family income		0.046	0.062	0.038	0.050	0.042
Household income		0.042	0.054	0.043	0.049	0.040
Per capita income		0.036	0.058	0.051	0.067	0.066
Income/needs ratio		0.043	0.064	0.045	0.064	0.059
Percent in poverty		0.232	0.337	0.305	0.414	0.300
Number (in thousands)	2,225	2,225	1,863	1,589	1,301	1,036

Table C-10. Standard Errors of Estimates of Mother's Employment After Departure of Father From the Household

Employment status	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent working full time, all weeks	3.74	4.31	4.80	4.80	5.27	5.81
Percent not working at all	4.61	3.91	3.99	4.73	4.74	5.59
Percent reporting weekly hours worked	4.26	3.65	3.48	4.44	4.80	5.71
Average weekly hours of those with hours ..	0.93	0.98	1.21	0.98	0.97	1.24
Number (in thousands).....	2,884	2,884	2,522	2,194	1,804	1,454

Table C-11. Standard Errors of Estimates of Mother's Employment After Departure of Father From the Household Among Children Whose Mother Is Not Observed to Remarry/Reconcile During the Panel

Employment status	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent working full-time, all weeks	4.04	4.31	4.97	4.93	6.20	6.55
Percent not working at all	5.46	4.06	4.05	4.68	5.19	6.41
Percent reporting weekly hours worked	5.01	3.89	3.59	4.40	5.17	6.65
Average weekly hours of those with hours ...	0.99	1.25	1.44	1.17	0.88	1.45
Number (in thousands).....	2,225	2,225	1,863	1,589	1,301	1,036

Table C-12. Standard Errors of Estimates of Mother's Earnings, Personal Income, and Reciprocity of Child Support, AFDC, and Food Stamps After Departure of Father From the Household

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent with \$1 or more of earned income	4.47	3.85	3.48	4.39	4.66	5.71
Average monthly earnings.....	\$57	\$54	\$76	\$52	\$44	\$60
Percent with \$1 or more of personal income ..	3.41	2.31	1.18	1.18	0.90	1.80
Average monthly income	\$60	\$67	\$74	\$52	\$69	\$69
Percent with \$1 or more in child support	2.92	3.60	3.71	4.08	4.23	5.40
Average monthly receipt	\$51	\$62	\$50	\$37	\$40	\$63
Percent with \$1 or more in AFDC income	2.46	3.04	3.94	3.94	4.23	4.72
Average monthly receipt	\$59	\$29	\$33	\$46	\$51	\$35
Percent with \$1 or more in food stamps	2.74	3.19	3.82	3.89	3.90	4.25
Average monthly receipt	\$28	\$14	\$15	\$19	\$24	\$27
Number (in thousands).....	2,884	2,884	2,522	2,194	1,804	1,451

Table C-13. Standard Errors of Estimates of Mother's Earnings, Personal Income, and Reciprocity of Child Support, AFDC, and Food Stamps After Departure of Father From the Household Among Children Whose Mothers Are Not Observed to Remarry/Reconcile During the Panel

Subject	Prior to loss	At time of loss	After loss of father from household			
			Time 1	Time 2	Time 3	Time 4
Percent with \$1 or more of earned income	5.10	4.12	3.59	4.40	5.07	6.65
Average monthly earnings	\$68	\$58	\$74	\$66	\$53	\$73
Percent with \$1 or more of personal income . .	3.90	1.72	0.80	1.54	0.85	1.16
Average monthly income	\$69	\$70	\$74	\$58	\$55	\$87
Percent with \$1 or more in child support	3.40	4.38	4.58	5.05	5.53	6.68
Average monthly receipt	\$77	\$44	\$35	\$43	\$47	\$69
Percent with \$1 or more in AFDC income	3.11	3.73	4.29	4.26	4.58	5.65
Average monthly receipt	\$59	\$28	\$32	\$49	\$46	\$44
Percent with \$1 or more in food stamps	2.80	3.88	4.28	4.25	4.49	5.39
Average monthly receipt	\$27	\$18	\$16	\$20	\$27	\$28
Number (in thousands)	2,225	2,225	1,863	1,589	1,301	1,036

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